

EFFECTS OF WOOD ASH ON POTASSIUM NUTRITION AND SOIL PH IN RICE CULTIVATION, LOW COUNTRY WET ZONE IN SRI LANKA

M.A.E. Harshamali¹, M.G.N. Rupasinghe² and D.M.S. Duminda¹

¹*Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Regional Rice Research and Development Centre, Bombuwala, Sri Lanka.*

The escalating demand for rice in Sri Lanka is driven by its health benefits and nutritional improvement. Low soil pH in paddy fields causes lower productivity in the low country wet zone (LCWZ). A study was conducted to investigate the impacts of wood ash application on soil pH and potassium nutrition in rice growing acidic soil in LCWZ. A pot experiment was conducted by growing Bw 312 rice variety until vegetative stage with two different liming materials namely dolomite and wood ash in a randomized complete block design with three replicates. Treatments were: T1- no liming with no nitrogen (N), phosphorous (P) and potassium (K), T2- no liming with N, K and P, T3- dolomite (2 t ha⁻¹) with N, P and K, T4- wood ash (390 kg ha⁻¹) with N and P, with half the recommended dose of K supplied from wood ash and the rest from muriate of potash, T5- wood ash (780 kg ha⁻¹) with N and P, with wood ash supplied all potassium. Data on plant height, root and shoot dry weight, soil pH, EC, exchangeable potassium, available phosphorous, exchangeable calcium and magnesium were analysed utilizing the analysis of variance using SAS and means were separated by DMRT. Significantly higher ($p < 0.05$) plant height, root and shoot dry weight, plant potassium and phosphorous content, soil exchangeable calcium and available phosphorous were found in T4 treatment. Soil pH increased up to 5.5 with dolomite application (T3). However, it was below 5 in wood ash treated soils. Potassium content in T4 treated soil was 50% higher than the dolomite treatment. Soil was not salinized by none of the liming material. In conclusion, wood ash considered as an acceptable alternative liming agent which also provides potassium. However, it is needed to apply the wood ash in a higher rate to reach the acceptable soil pH for rice.

Keywords: Acidic soils, Liming material, Productivity, Vegetative stage